Birla Institute of Technology & Science, Pilani, Rajasthan 333031
Second Semester 2022-2023

Course Number: CHEM F341	**Course Title: Chemical Experimentation Lab II**
Test syllabus: Cycle II experiments	**Marks: 12** **Time: 15 mins**

Experiment 7: Electrode Kinetics (3M)

Q 1. Why Ohmic Drop (IR) occur?   **[1]**
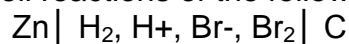**Answer:**

Q2. When the electrode is said as polarizable electrode?   **[1]**
Answer:

Q3. Write the half-cell reactions of the following cell:
$$Zn\mid H_2, H+, Br-, Br_2 \mid C$$
                                                                                 [1]

Answer:

Experiment 8: Osmotic Pressure (3M)

Q1. What would be the concentration of a nonelectrolyte solute of molecular weight 180 gm/mole in gm/litre which is isotonic with a 0.1 N solution of NaCl at 25^0C? Assume complete dissociation of NaCl. (The R value is 0.082 L-atm mol^{-1} K^{-1})   **[1]**

(a) 36 gm/litre   (b) 20 gm/litre   (c) 50 gm/litre   (d) 10 gm/litre

Q2. What thermodynamic properties responsible for osmosis of solvent from lower solute concentration to higher solute concentration?   **[1]**

(a) Enthalpy   (b) Entropy   (c) Internal Energy   (d) Chemical potential

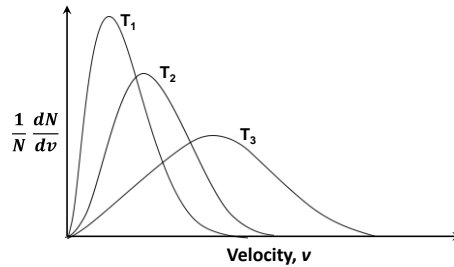Q3. Drinking water can be obtained from sea water using the process   **[1]**

(a) Osmosis   (b) Diffusion   (c) Reverse osmosis   (d) Fermentation

Experiment 9: Maxwell-Boltzmann (3M)

Q1. Based on the following Maxwell-Boltzmann distribution curves, the decreasing order of the temperatures T_1, T_2, and T_3 is…………………………………………….. **[1]**

Answer:

Q2. The rms speed of nitrogen molecules in gas at 300 K is (consider R = 8.314 J/mol/K)……………………………………………......................... **[1]**

Q3. When the temperature of a gas is increased from 50 ^{o}C to 200 ^{o}C, the ratio of the average velocity change from 50 ^{o}C to 200 ^{o}C is……………………………………… **[1]**

Experiment 10: Depression of freezing point (3M)

Q1. 228 grams of propylene glycol crystals are mixed with 500 grams of CS_2. What is the depression in freezing point? (Melting point and cryoscopic constant of the solvent are 112°C and -3.83 K kgmol^{-1}, respectively; MW of solute, 76)
(a) -23°C   (b) -135°C   (c) -20°C   (d) -100°C

Q2. 2 g of a non-electrolyte solute dissolved in 100g of benzene. As a result, the freezing point of benzene was lowered by 0.4K. The molar mass of the solute will be (cryoscopic constant of the solvent = 5.12 Kkgmol^{-1})
(a) 250 g mol^{-1};   (b) 252 g mol^{-1} (c) 256 g mol^{-1} (d) 258 g mol^{-1}

Q3. During depression of freezing point in a solution the following are in equilibrium
(a) Liquid solvent, solid solvent   (b) Liquid solvent, solid solute
(c) Liquid solute, solid solute   (d) Liquid solute, solid solvent

*******END*******